Glossary of Hydrologic Terms

Ablation :
The process by which ice and snow dissipate owing to melting and evaporation.

Abutment :
The part of a valley or canyon wall against which a dam is constructed. Right and left abutments are those on respective sides of an observer looking downstream.

Abutment Seepage :
Reservoir water that moves through seams or pores in the natural abutment material and exits as seepage.

Acre-foot :
The amount of water required to cover one acre to a depth of one foot. An acre-foot equals 326,851 gallons, or 43,560 cubic feet.

Active Conservation Storage :
The portion of water stored in a reservoir that can be released for all useful purposes such as municipal water supply, power, irrigation, recreation, fish, wildlife, etc. Conservation storage is the volume of water stored between the inactive pool elevation and flood control stage.

Active (Usable) Storage Capacity :
The total amount of reservoir capacity normally available for release from a reservoir below the maximum storage level. It is total or reservoir capacity minus inactive storage capacity. More specifically, it is the volume of water between the outlet works and the spillway crest.

Adirondack Type Snow Sampling Set :
A snow sampler consisting of a 5-foot fiberglass tube, 3 inches in diameter, with a serrated-edge steel cutter at one end and a twisting handle at the other. This sampler has a 60-inch snow depth capacity.

ADVIS :
A program which combines the Antecedent Precipitation Index (API) method of estimating runoff with unit hydrograph theory to estimate streamflow for a headwater basin.

Aeration Zone :
A portion of the lithosphere in which the functional interstices of permeable rock or earth are not filled with water under hydrostatic pressure. The interstices either are not filled with water or are filled with water that is no held by capillarity.

AFOS :
Automation of Field Operations and Services

Afterbay :
The tail race of a hydroelectric power plant at the outlet of the turbines. The term may be applied to a short stretch of stream or conduit, or to a pond or reservoir.

Agglomerate :
An ice cover of floe formed by the freezing together of various forms of ice.

AHOS :
Automatic Hydrologic Observing System

AHOS-S :
Automatic Hydrologic Observing System - Satellite

AHOS-T :
Automatic Hydrologic Observing System - Telephone

Airborne Snow Survey Program :

Center (NOHRSC) program that makes airborne snow water equivalent and soil moisture measurements over large areas of the country that are subject to severe and chronic snow melt flooding.

Airborne Snow Water Equivalent Measurement Theory :

A theory based on the fact that natural terrestrial gamma radiation is emitted from the potassium, uranium, and thorium radioisotopes in the upper eight inches of the soil. The radiation is sensed from low flying aircraft 500 feet above the ground. Water mass in the snow cover attenuates the terrestrial radiation signal. The difference between airborne radiation measurements made over bare ground and snow-covered ground can be used to calculate a mean areal snow water equivalent value with a root mean square error of less than a half inch.

Albedo :

The portion of incoming radiation which is reflected by a surface.

ALERT Flood Warning System :

A cooperative, community-operated flood warning system; the acronym stands for Automated Local Evaluation (in) Real Time.

Alert Stage :

The elevation, or stage, of a stream at which need-to-know officials (e.g., county sheriff, civil defense officials, bypass gate operators) are notified of the threat of possible flooding. Same as caution stage.

Alluvial :

An adjective referring to alluvium.

Alluvium :

Sediments deposited by erosional processes, usually by streams.

Anabranch :

A diverging branch of a river which re-enters the main stream.

Anchor Ice :

Submerged Frazil ice attached or anchored to the river bottom, irrespective of its formation.

Anchor Ice Dam :

An accumulation of anchor ice which acts as a dam and raises the water level.

Annual Flood :

The maximum discharge peak during a given water year (October 1 - September 30).

Antecedent Precipitation Index (API) :

An index of moisture stored within a drainage basin before a storm.

API Method :

A statistical method to estimate the amount of surface runoff which will occur from a basin from a given rainstorm based on the antecedent precipitation index, physical characteristics of the basin, time of year, storm duration, rainfall amount, and rainfall intensity.

Aquiclude :

A formation which contains water but cannot transmit it rapidly enough to furnish a significant supply to a well or spring.

Aquifer :

Permeable layers of underground rock, or sand that hold or transmit groundwater below the water table that will yield water to a well in sufficient quantities to produce water for beneficial use.

Aquifuge :

A geologic formation which has no interconnected openings and cannot hold or transmit water.

Arch Dam :

A concrete arch dam is used in sites where the ratio of width between abutments to height is not great and where the foundation at the abutments is solid rock capable of resisting great forces. The arch provides resistance to movement. When combined with the weight of concrete (arch-gravity dam), both the weight and shape of the structure provide great resistance to the pressure of water.

Area of Influence :

The area covered by the drawdown curves of a given pumping well or combination of wells at a particular time.

Area-Capacity Curve :

A graph showing the relation between the surface area of the water in a reservoir, the corresponding volume, and elevation.

Area Wide Hydrologic Prediction System (AWHPS) :

A computer system which automatically ingests areal flash flood guidance values and WSR-88D products and displays this data and other hydrologic information on a map background.

Arid :

An adjunctive applied to regions where precipitation is so deficient in quantity, or occurs at such times, that agriculture is impracticable without irrigation.

Arroyo :

A water-carved channel or gully in arid country, usually rather small with steep banks, dry most of the time, due to infrequent rainfall and the shallowness of the cut which does not penetrate below the level of permanent ground water.

Artesian Well :

A well drilled into a confined aquifer.

Artificial Control :

A weir or other man-made structure which serves as the control for a stream-gaging station.

ASAP :

AHOS SHEF Automatic Processing System

ASAPTRAN :

The software component of ASAP.

ASOS :

The ASOS program is a joint effort of the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). When installation is completed in the mid-1990s, the ASOS systems will serve as the nation's primary surface weather observing network. ASOS is designed to support weather forecast activities and aviation operations and, at the same time, support the needs of the meteorological, hydrological, and climatological research communities.

ATDTDCS (Automated Tone Dial Telephone Data Collection System) :

Data collection system where cooperative observers collect precipitation, stage, and temperature data then transmit the data to the NWS ATDTDCS computer through the telephone lines. The ATDTDCS computer transmits the data to AFOS.

Attenuation :

The process where the flood crest is reduced as it progresses downstream.

Automated Event-Reporting Gage :

(see Tipping Bucket Rain Gage); for river stage gages, IFLOWS pressure transducer type gages can be programmed to report if water surface rises or falls by a predetermined amount.

Automated Local Evaluation in Real Time (ALERT) :
A local flood warning system where river and rainfall data are collected via radio signals in real-time at an ALERT base station.

AWIPS :
Advanced Weather Interactive Processing System. A system that will eventually replace Automation of Field Operations and Services, AFOS.

B-44 Form, Cooperative Station Report :
A Weather Service form documenting station management, exposure, topography, driving instructions, payment information, hydrometeorologic equipment, and observing information.

Backflow :
The backing up of water through a conduit or channel in the direction opposite to normal flow.

Backsight :
A rod reading taken on a point of known elevation, a benchmark or a turning point. Backsights are added to the known elevation to arrive at the height of the instrument. With a known height of the instrument, the telescope can be used to determine the elevation of other points in the vicinity.

Backwater Curve :
The longitudinal profile of the surface of a liquid in a non-uniform flow in an open channel, when the water surface is not parallel to the invert owing to the depth of water having been increased by the interposition of an obstruction such as a dam or weir. The term is sometimes used in a generic sense to denote all water surface profiles; or for profiles where the water is flowing at depths greater than the critical.

Backwater Effect :
The effect which a dam or other obstruction or construction has in raising the surface of the water upstream from it.

Backwater Flooding :
Upstream flooding caused by downstream conditions such as channel restriction and/ or high flow in a downstream confluence stream.

Bank :
The margins of a channel. Banks are called right or left as viewed facing in the direction of the flow.

Bank Storage :
Water absorbed and stored in the void in the soil cover in the bed and banks of a stream, lake, or reservoir, and returned in whole or in part as the level of water body surface falls.

Bankfull Stage/Elevation :
An established river stage/water surface elevation at a given location along a river which is intended to represent the maximum water level that will not overflow the river banks or cause any significant damages from flooding.

Bankfull Stage :
An established river stage at a certain point along a river which is intended to represent the maximum safe water level which will not overflow the river banks or cause any significant damage within the reach of the river.

Barrage :
Any artificial obstruction placed in water to increase water level or divert it. Usually the idea is to control peak flow for later release.

Base Flood :
The national standard for flood plain management is the base, or one percent chance flood. This flood has at least one chance in 100 of occurring in any given year. It is also called a 100 year flood.

Base Station :
A computer which accepts radio signals from ALERT gaging sites, decodes the data, places the data in a database, and makes the data available to other users.

Baseflow :
Streamflow which results from precipitation that infiltrates into the soil and eventually moves through the soil to the stream channel. This is also referred to as ground water flow, or dry-weather flow.

Base Width :
The time duration of a unit hydrograph.

Basin :
An area having a common outlet for its surface runoff.

Basin Boundary :
The topographic dividing line around the perimeter of a basin, beyond which overland flow (i.e.; runoff) drains away into another basin.

Basin Lag :
The time it takes from the centroid of rainfall for the hydrograph to peak.

Basin Recharge :
Rainfall that adds to the residual moisture of the basin in order to help recharge the water deficit. i.e; water absorbed into the soil that does not take the form of direct runoff.

Bed Load :
Sand, silt, gravel, or soil and rock detritus carried by a stream on or immediately above its bed. The particles of this material have a density or grain size such as to preclude movement far above or for a long distance out of contact with the stream bed under natural conditions of flow.

Beginning of the Breakup :
Date of definite breaking, movement, or melting of ice cover or significant rise of water level.

Beginning of Freezup :
Date on which ice forming a stable winter ice cover is first observed on the water surface.

Benchmark (BM) :
A permanent point whose known elevation is tied to a national network. These points are created to serve as a point of reference. Benchmarks have generally been established by the USGS, but may have been established by other Federal or local agencies. Benchmarks can be found on USGS maps.

Black Ice :
Transparent ice formed in rivers and lakes, or on roads and bridges.

Border ice :
An ice sheet in the form of a long border attached to the bank or shore.; shore ice.

Brackish Ice :
Ice formed from Brackish water.

Braided Stream :
Characterized by successive division and rejoining of streamflow with accompanying islands. A braided stream is composed of anabranches.

Brash Ice :
Accumulation of floating ice made up of fragments not more than 2 meters across; the wreckage of other forms of ice.

Breach :
The failed opening in a dam.

Breakup :
The time when a river whose surface has been frozen from bank to bank for a significant portion of its length begins to change to an open water flow condition. Breakup is signaled by the breaking of the ice and often associated with ice jams and flooding.

Breakup date :
Date on which a body of water is first observed to be entirely clear of ice and remains clear thereafter.

Breakup jam :
Ice jam that occurs as a result of the accumulation of broken ice pieces.

Breakup period :
The period of disintegration of an ice cover.

Bubbler Gage :
A water stage recording device that is capable of attaching to a LARC for data automation purposes.

Buttress Dam :
Buttress dams are comprised of reinforced masonry or stonework built against concrete. They are usually in the form of flat decks or multiple arches. They require about 60 percent less concrete than gravity dams, but the increased form work and reinforcement steel required usually offset the savings in concrete. Many were built in the 1930's when the ratio of labor cost to materials was comparatively low. However, this type of construction is not competitive with other types of dams when labor costs are high.

CADAS (Centralized Automated Data Acquisition System) :
A system of two minicomputers in NWSH that interrogates LARCs and DARDCs by telephone every 6 hours and transmits the data to AFOS via HADS.

Calibration :
The process of using historical data to estimate parameters in a hydrologic forecast technique such as SACSMA, routings, and unit hydrographs.

Capillarity :
(1)The degree to which a material or object containing minute openings or passages, when immersed in a liquid, will draw the surface of the liquid above the hydrostatic level. Unless otherwise defined, the liquid is generally assumed to be water. (2)The phenomenon by which water is held in interstices above the normal hydrostatic level, due to attraction between water molecules.

Capillary Fringe :
The soil area just above the water table where water can rise up slightly through the cohesive force of capillary action. This layer ranges in depth from a couple of inches, to a few feet, and it depends on the pore sizes of the materials. The capillary fringe is also called the capillary zone.

Capillary Potential :
The work required to move a unit mass of water from the reference plane to any point in the soil column.

Capillary Zone :
The soil area just above the water table where water can rise up slightly through the cohesive force of capillary action. This layer ranges in depth from a couple of inches, to a few feet, and it depends on the pore sizes of the materials. The capillary zone is also called the capillary fringe.

Catchment Area :
An area having a common outlet for its surface runoff (also see Drainage Area or Basin, Watershed).

Caution Stage :
Same as alert stage.

CFS (Cubic Feet per Second) :
The flow rate or discharge equal to one cubic foot (of water, usually) per second. This rate is equivalent to approximately 7.48 gallons per second. This is also referred to as a second-foot.

Cfs-Day :
The volume of water discharged in twenty four hours, with a flow of one cubic foot per second is widely used; 1 cfs-day is 24 x 60 x 60 = 86,000 cubic feet, 1.983471 acre-feet, or 646,317 gallons. The average flow in cubic feet per second for any time period is the volume of flow in cfs-days.

Channel (watercourse) :
An open conduit either naturally or artificially created which periodically, or continuously contains moving water, or forms a connecting link between two bodies of water. River, creek, run, branch, anabranch, and tributary are some of the terms used to describe natural channels. Natural channels may be single or braided. Canal and floodway are some of the terms used to describe artificial channels.

Channel Inflow :
Water, which at any instant, is flowing into the channel system form surface flow, subsurface flow, base flow, and rainfall that has directly fallen onto the channel.

Channel Lead :
An elongated opening in the ice cover caused by a water current.

Channel Routing :
The process of determining progressively timing and shape of the flood wave at successive points along a river.

Channelization :
The modification of a natural river channel; may include deepening, widening, or straightening.

Closed Basin :
A basin draining to some depression or pond within its area, from which water is lost only by evaporation or percolation. A basin without a surface outlet for precipitation.

Closed Basin Lake Flooding :
Flooding that occurs on lakes with either no outlet or a relatively small one. Seasonal increases in rainfall cause the lake level to rise faster than it can drain. The water may stay at flood stage for weeks, months, or years.

CNIF :
Calibration Network Information Files

Coastal Flooding :
Flooding that occurs from storms where water is driven onto land from an adjacent body of water. These can be hurricanes, "nor'easters," or tropical storms, but even a severe winter storm or thunderstorm can cause this type of flooding.

COE :
U.S. Army Corps of Engineers

Columnar Ice :
Ice consisting of columnar shaped grain. The ordinary black ice is usually columnar-grained.

Composite Hydrograph :

A stream discharge hydrograph which includes base flow, or one which corresponds to a net rain storm of duration longer than one unit period.

Cone of Depression :

The depression, roughly conical in shape, produced in a water table, or other piezometric surface, by the extraction of water from a well at a given rate. The volume of the cone will vary with the rate of withdrawal of water. Also called the Cone of Influence.

Cone of Influence :

The depression, roughly conical in shape, produced in a water table, or other piezometric surface, by the extraction of water from a well at a given rate. The volume of the cone will vary with rate of withdrawal of water. Also called the Cone of Depression.

Confined Ground Water :

Ground water held under an aquiclude or an aquifuge called artesian if the pressure is positive.

Congressional Organic Act of 1890 :

The act that assigned the responsibility of river and floor forecasting for the benefit of the general welfare of the Nation's people and economy to the Weather Bureau, and subsequently the National Weather Service.

Conservation Storage :

Storage of water for later release for usual purposes such as municipal water supply, power, or irrigation in contrast with storage capacity used for flood control..

Consolidated Ice Cover :

Ice cover formed by the packing and freezing together of floes, brash ice and other forms of floating ice.

Contents :

The volume of water in a reservoir. Unless otherwise indicated reservoir content is computed on the basis of a level pool and does not include bank storage.

Control Points : Horizontal and Vertical :

Small monuments securely embedded in the surface of the dam. Any movement of the monument indicates a movement in the dam itself. Movements in the dam are detected by comparing control points location to location of fixed monuments located off the dam using accurate survey techniques.

Cooperative Observer :

An individual (or institution) who takes precipitation and temperature observations-and in some cases other observations such as river stage, soil temperature, and evaporation-at or near their home, or place of business. Many observers transmit their reports by touch-tone telephone to an NWS computer, and nearly all observers mail monthly reports to the National Climatic Data Center to be archived and published.

Conveyance Loss :

The loss of water from a conduit due to leakage, seepage, evaporation, or evapo-transpiration.

Corn Snow Ice :

Rotten granular ice.

County Warning Forecast Area (CWFA) :

The area (aggregation of counties, or parishes and sometimes portions of counties, or parishes) served by a WFO for which weather forecast and warning services are provided.

Crack :

A separation formed in an ice cover of floe that does not divide it into two or more pieces.

Creek :

A small stream of water which serves as the natural drainage course for a drainage basin of nominal, or small size. The term is a relative one as to size, some creeks in the humid section would be called rivers if they occurred in the arid portion.

Crest :

(1)The highest stage or level of a flood wave as it passes a point. (2)The top of a dam, dike, spillway, or weir, to which water must rise before passing over the structure.

Crest Gage :

A gage used to obtain a record of flood crests at sites where recording gages are installed.

Crest (Top) of Dam :

The elevation of the uppermost surface of a dam excluding any parapet walls, railings, etc.

Crest Width (Top thickness) :

The thickness or width of a dam at the level of the crest (top) of the dam. The term "thickness" is used for gravity and arch dams and "width" for other types of dams.

Critical Depth :

The depth of water flowing in an open channel or conduit, partially filled, corresponding to one of the recognized critical velocities.

Critical Flow :

A condition of flow where the mean velocity is at one of the critical values; ordinarily at Belanger's critical depth and velocity. Another important usage is in reference to the Reynolds' critical velocities which define the point at which the flow changes from streamline or nonturbulent to turbulent flow.

Critical Rainfall Probability (CRP) :

The probability that the actual precipitation during a rainfall event has exceeded or will exceed the flash flood guidance value.

Cross-sectional area :

Area perpendicular to the direction of flow.

CRP :

Critical Rainfall Probability. The Probability that a given rainfall will cause a river, or stream to rise above flood stage.

Cryology :

The science of the physical aspects of snow, ice, hail, and sleet and other forms of water produced by temperatures below Zero degrees Celsius.

Cubic Feet Per Second :

A unit expressing rates of discharge. One cubic foot per second is equal to the discharge through a rectangular cross section, 1 foot wide by 1 foot deep, flowing at an average velocity of 1 foot per second. It is also approximately 7.48 gallons per second.

Curtain Drain :

A drain constructed at the upper end of the area to be drained, to intercept surface or ground water flowing toward the protected area from higher ground, and carry it away from the area. Also called an Intercepting Drain.

Current meter :

Device used to measure the water velocity or current in a river.

Daily Flood Peak :

The maximum mean daily discharge occurring in a stream during a given flood event.

Dam :

Any artificial barrier which impounds or diverts water. The dam is generally hydrologically significant if it is:
1. 25 feet or more in height from the natural bed of the stream and has a storage of at least 15 acre-feet.
2. Or has an impounding capacity of 50 acre-feet or more and is at least six feet above the natural bed of the stream.

DAMBRK :

The Dam Break Forecasting Model.

Dam Failure :

Catastrophic event characterized by the sudden, rapid, and uncontrolled release of impounded water.

DAPM :

The Data Acquisition Program Manager.

DATACOL :

The Software System that supports RFC gateway functions.

DATANET :

Hydrologic Data Network Analysis Software

Day-Second Feet :

Often abbreviated as SDF. See Second-Day Feet.

DCP (Data Collection Platform) :

An electronic device that connects to a river or rainfall gage that records data from the gage and at pre-determined times transmits that data through a satellite to a remote computer.

DDS :

Data Distribution System

Dead Storage :

The volume in a reservoir below the lowest controllable level.

Deep Percolation Loss :

Water that percolates downward through the soil beyond the reach of plant roots.

Deep Seepage :

Infiltration which reaches the water table.

Deep well :

A well whose pumping head is too great to permit use of a suction pump.

Deformed Ice :

A general term for ice which has been squeezed together and forced upwards and downwards in places. Subdivisions are rated ice, ridge ice, hummocked ice, and other similar deformations.

Degradation :

The geologic process by means of which various parts of the surface of the earth are worn down and carried away and their general level lowered, by the action of wind and water.

Delta :

An alluvial deposit, often in the shape of the Greek letter "delta", which is formed where a stream drops its debris load on entering a body of quieter water.

Dendrites :

Thin branch-like growth of ice on the water surface.

Dendritic :

The form of the drainage pattern of a stream and it's tributaries when it follows a treelike shape, with the main trunk, branches, and twigs corresponding to the main stream, tributaries, and subtributaries, respectively, of the stream.

Density Current :

A flow of water maintained by gravity through a large body of water, such as a reservoir or lake, and retaining its unmixed identity because of a difference in density.

Density of Snow :

The ratio, expressed as a percentage, of the volume which a given quantity of snow would occupy if it were reduced to water, to the volume of the snow. When a snow sampler is used, it is the ratio expressed as percentage of the scale reading on the sampler to the length of the snow core or sample.

Depletion Curve :

That part of the hydrograph extending from the point of termination of the Recession Curve to the subsequent rise or alternation of inflow due to additional water becoming available for stream flow.

Depression Storage :

The volume of water contained in natural depressions in the land surface, such as puddles.

Depth of Runoff :

The total runoff from a drainage basin, divided by its area. For convenience in comparing runoff with precipitation, the term is usually expressed in inches of depth during a given period of time over the drainage area or acre-feet per square mile.

Design Criteria :

The hypothetical flood used in the sizing of the dam and the associated structures to prevent dam failure by overtopping, especially for the spillway, outlet works, channel culvert, and inlet sizing.

Detention Basins :

Detention basins are normally dry, but are designed to detain surface water temporarily during, and immediately after a runoff event. Their primary function is to attenuate the storm flows by releasing flows at a lower flow rate. There are no gates or valves allowed on the outlet so that water can never be stored on a long-term basis. Typical detention times in such a basin would be on the order of 24 to 72 hours although some are as long as 5 to 10 days.

Detention Storage :

The volume of water, other than depression storage, existing on the land surface as flowing water which has not yet reached the channel.

Detritus :

(1) the heavier mineral debris moved by natural watercourses, usually in bed-load form. (2) the sand, grit, and other coarse material removed by differential sedimentation in a relatively short period of detention.

Diffuse Ice :

Poorly defined ice edge limiting an area of dispersed ice; usually on the leeward side of an area of floating ice.

Direct Flood Damage :

The damage done to property, structures, goods, etc., by a flood as measured by the cost of replacement and repairs.

Direct Runoff :

The runoff entering stream channels promptly after rainfall or snow melt. Superposed on base runoff, it forms the bulk of the hydrograph of a flood.

Discharge :

The rate at which water passes a given point. Discharge is expressed in a volume per time with units of L3/T. Discharge is often used interchangeably with streamflow.

Discharge Curve :

A curve that expresses the relation between the discharge of a stream or open conduit at a given location and the stage or elevation of the liquid surface at or near that location. Also called Rating Curve and Discharge Rating Curve.

Discharge Table :

(1) A table showing the relation between two mutually dependant quantities or variable over a given range of magnitude. (2) A table showing the relation between the gage height and the discharge of a stream or conduit at a given gaging station. Also called a Rating Table.

Distribution (Hydro)Graph :

A unit hydrograph of direct runoff modified to show the proportions of the volume of runoff that occur during successive equal units of time.

Diversion :

The taking of water from a stream or other body of water into a canal, pipe, or other conduit.

Divide :

The high ground that forms the boundary of a watershed. A divide is also called a ridge.

DNR :

Department of Natural Resources

DOH :

Development and Operations Hydrologist

Domestic Consumption :

The quantity, or quantity per capita, of water consumed in a municipality or district for domestic uses or purposes during a given period, generally one day. It is usually taken to include all uses included within the term Municipal Use of Water and quantity wasted, lost, or otherwise unaccounted for.

Domestic Use of water :

The use of water primarily for household purposes, the watering of livestock, the irrigation of gardens, lawns, shrubbery, etc., surrounding a house or domicile.

Downstream Slope :

The slope or face of the dam away from the reservoir water. This slope requires some kind of protection (e.g.; grass) from the erosive effects of rain and surface flow.

Drainage Area :

An area having a common outlet for its surface runoff (also see Watershed and Catchment Area).

Drainage Basin :

A part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Drainage Density :

The relative density of natural drainage channels in a given area. It is usually expressed in terms of miles of natural drainage or stream channel per square mile of area, and obtained by dividing the total length of stream channels in the area in miles by the area in square miles.

Drainage Divide :

The boundary line, along a topographic ridge or along a subsurface formation, separating two adjacent drainage basins.

Drains (Relief Wells) :

A vertical well or borehole, usually downstream of impervious cores, grout curtains or cutoffs, designed to collect and direct seepage through or under a dam to reduce uplift pressure under or within a dam. A line of such wells forms a "drainage curtain".

Drawdown :

The lowering of the surface elevation of a body of water, the water surface of a well, the water table, or the piezometric surface adjacent to the well, resulting from the withdrawal of water therefrom.

Dredging :

The scooping, or suction of underwater material from a harbor, or waterway. Dredging is one form of channel modification. It is often too expensive to be practical because the dredged material must be disposed of somewhere and the stream will usually fill back up with sediment in a few years. Dredging is usually undertaken only on large rivers to maintain a navigation channel.

Drifting Ice :

Pieces of floating ice moving under the action of wind and/ or currents.

Drought :

A period of abnormally dry weather sufficiently prolonged from the lack of precipitation to cause a serious hydrologic imbalance.

Drought Index :

Computed value which is related to some of the cumulative effects of a prolonged and abnormal moisture deficiency. (An index of hydrological drought corresponding to levels below the mean in streams, lakes, and reservoirs.)

Dry Crack :

Crack visible at the surface but not going right through the ice cover, and therefore it is dry.

Dry Flood proofing :

A dry flood proofed building is sealed against floodwaters. All areas below the flood protection level are made watertight. Walls are coated with waterproofing compounds or plastic sheeting. Openings like doors windows, sewer lines and vents are closed, wether permanently, with removable shields, or with sandbags. The flood protection level should be no more than 2 or 3 feet above the top of the foundation because the buildings walls and floors cannot withstand the pressure of deeper water.

Dry Weather Flow :

Streamflow which results from precipitation that infiltrates into the soil and eventually moves through the soil to the stream channel. This is also referred to as base flow, or ground water flow.

Duration Curve :

A cumulative frequency curve that shows the percent of time during which specified units of items (e.g. discharge, head, power, etc.) were equaled or exceeded in a given period. It is the integral of the frequency diagram.

Duration of Ice Cover :

The time from freeze-up to break-up of an ice cover.

Dynamic Ice :

Pressure due to a moving ice cover or drifting ice.

Dynamic Wave Routing Model (DWOPER) :

A computerized hydraulic routing program whose algorithms incorporate the complete one-dimensional equations of unsteady flow originally developed by Barre' De Saint-Venant in 1871.

E-3, Flood Stage Report :

A form that a Service Hydrologist/ Hydrology Focal Point completes to document the dates in which forecast points are above flood stage, as well as the crest dates and stages. Discussion of the flood event must also be included in the E-5, Monthly Report of River and Flood conditions. An E-3 report is sent to Regional Headquarters, the appropriate RFC, as well as the Office of Hydrology (OH).

E-5, Monthly Report of River and Flood conditions :

A monthly narrative report covering flooding which occurred over the past month. Flood stage, flood crest and dates in which flooding occurred is covered within this report for each data point which was in flood. If the flooding involved a forecast point, an E-3 must be filled out as well. If no flooding has occurred within the past month, a climatic summary of the past month can be included as well as other interesting non-flood events, such as water supply, ice jams and the occurrence of drought. An E-5 report is sent to Regional Headquarters, the appropriate RFC, as well as the Office of Hydrology (OH).

E-7, Flood Damage Report :

A report to be completed anytime there is reported flood damage or loss of life as a direct result of flooding. An E-7 report is sent to Regional Headquarters, as well as the Office of Hydrology (OH).

E-19, Report on River Gage Station :

A report to be completed every 5 - 10 years providing a complete history of a river station and all gages that have been used for public forecasts since the establishment of the station. Should be updated anytime a significant change occurs at a forecast point.

E-19a, Abridged Report on River Gage Station :

An abridged version of an E-19, an E-19a used to be used to update the E-19 as additional information, or changes occur at the station during the intervening five year period. No longer relevant since E-19s can be updated and produced rapidly on computers or on AWIPS. An E-19a can also be used to take the place of an E-19 in documenting any gage history, or information of any non-forecast point (i.e; data point).

Earthen (or Earthfill) Dam :

An embankment dam in which more than 50% of the total volume is formed of compacted fine-grained material. A homogeneous earthen dam is constructed of similar earthen material throughout. These are the most common type of dam because their construction involves using materials in the natural state, requiring little processing.

Effective Porosity :

The ratio, usually expressed as a percentage, of the volume of water or other liquid which a given saturated volume of rock or soil will yield under any specified hydraulic condition, to the given volume of soil or rock.

Effective Precipitation (Rainfall) :

(1) That part of the precipitation that produces runoff. (2) A weighted average of current and antecedent precipitation that is "effective" in correlating with runoff. (3) That part of the precipitation falling on an irrigated area that is effective in meeting the consumptive use requirements.

Effluent Seepage :

Diffuse discharge of ground water to the ground surface.

Effluent Stream :

Any watercourse in which all, or a portion of the water volume came from the Phreatic zone, or zone of saturation by way of groundwater flow, or baseflow.

EIF :

Enhanced IFLOWS Format

Embankment :

Fill material, usually earth or rock, placed with sloping sides and usually with length greater than height. All dams are types of embankments.

Emergency Action Plan :

A predetermined plan of action to be taken to reduce the potential for property damage and loss of life in an area affected by a dam break or excessive spillway release.

Emergency Services :

Services provided in order to minimize the impact of a flood that is already happening. These measures are the responsibility of city, or county emergency management staff and the owners or operators of major, or critical facilities. Some examples of emergency services are flood warning and evacuation, flood response, and post flood activities.

Energy Dissipator :

A structure which slows fast-moving spillway flows in order to prevent erosion of the stream channel.

Engineer's Level :

A telescope which is attached to a spirit-tube level, all revolving around a vertical axis and is mounted on a tripod. An Engineer's Level is used for determining the difference in elevation between two points. The telescope on the level has a vertical cross hair and a horizontal cross hair. Once the instrument is leveled, the sighting through the horizontal cross hair represent a horizontal plane of equal elevation.

Ensemble Hydrologic Forecasting :

A process whereby a continuous hydrologic model is successively executed several times for the same forecast period by use of varied data input scenarios, or a perturbation of a key variable state for each model run. A common method employed to obtain a varied data input scenario is to use the historical meteorological record, with the assumption that several years of observed data covering the time period beginning on the current date and extending through the forecast period comprises a reasonable estimate of the possible range of future conditions.

Equilibrium Drawdown :

The ultimate, constant drawdown for a steady rate of pumped discharge.

Equilibrium Surface Discharge :

The steady rate of surface discharge which results from a long-continued, steady rate of net rainfall, with discharge rate equal to net rainfall rate.

Equilibrium Time :

The time when flow conditions become substantially equal to those corresponding to equilibrium discharge or equilibrium drawdown.

Equi-Potential Line :

A line, in a field of flow, such that the total head is the same for all points on the line, and therefore the direction of flow is perpendicular to the line at all points.

Erosion :

Wearing away of the lands by running water, glaciers, winds, and waves, can be subdivided into three process: Corrasion, Corrosion, and Transportation. Weathering, although sometimes included here, is a distant process which does not imply removal of any material.

ESP :

Extended Streamflow Prediction

ESPINIT :

ESP Initialization Program

Esturine waters :

Deepwater tidal habitats and tidal wetlands that are usually enclosed by land but have access to the ocean and are at least occasionally diluted by freshwater runoff from the land (such as bays, mouths of rivers, salt marshes, lagoons).

Esturine Zone :
The area near the coastline that consists of estuaries and coastal saltwater wetlands.

Estuary :
The thin zone along a coastline where freshwater systems and rivers meet and mix with a salty ocean (such as a bay, mouth of a river, salt marsh, lagoon).

Evaporimeter :
An instrument which measures the evaporation rate of water into the atmosphere.

Evaporation :
Process by which liquid water is converted into water vapor.

Evaporation Pan :
A pan used to hold water during observations for the determination of the quantity of evaporation at a given location. Such pans are of varying sizes and shapes, the most commonly used being circular or square.

Evaporation Rate :
The quantity of water, expressed in terms of depth of liquid water, which is evaporated from a given surface per unit of time. It is usually expressed in inches depth, per day, month, or year.

Evapotranspiration :
Combination of evaporation from free water surfaces and transpiration of water from plant surfaces to the atmosphere.

Excess Rain :
Effective rainfall in excess of infiltration capacity.

Exclusive Flood Control Storage Capacity :
The space in a reservoir reserved for the sole purpose of regulating flood inflows to abate flood damage.

Face :
The external surface of a structure, such as the surface of a dam.

FCEXEC :
A component of the NWSRFS FCST Program.

FCST :
NWSRFS Forecast Program to produce operational forecasts.

Federal Emergency Management Agency (FEMA) :
An agency of the federal government having responsibilities in hazzard mitigation; FEMA also administers the National Flood Insurance Program.

Federal Snow Sampler :
A snow sampler consisting of five or more sections of sampling tubes, one which has a steel cutter on the end. The combined snowpack measuring depth is 150 inches. This instrument was formerly the Mount Rose Type Snow Sampling Set.

Fetch :
An area of the sea surface over which a wind with constant direction and velocity is blowing.

Field (Moisture) Capacity :
The amount of water held in soil against the pull of gravity.

Field Moisture Deficiency :
The quantity of water, which would be required to restore the soil moisture to field moisture capacity.

Fill Dam :
Any dam constructed of excavated natural materials or of industrial wastes.

Firn (Snow) :
Old snow on top of glaciers, granular and compact and not yet converted into ice. It is a transitional stage between snow and ice. Also called Neve.

Firn Line :
The highest level to which the fresh snow on a glacier's surface retreats during the melting season. The line separating the accumulation area from the ablation area.

Fischer & Porter Punched Tape Recorder Gage :
A precipitation gage which converts weight into a code disk position. The code disk position is then punched on paper tape in a binary decimal format suitable for automatic machine processing.

Flash Flood :
A flood which follows within a few hours (usually less than 6 hours) of heavy or excessive rainfall, dam or levee failure, or the sudden release of water impounded by an ice jam.

Flash Flood Guidance (FFG) :
An internal product produced by the RFCs containing rainfall threshold values which must be exceeded in order to produce a flash flood.

Flash Flood Statement (FFS) :
A statement by the NWS which provides follow-up information on flash flood watches and warnings. (In Western Region, the product header FLS is used for Flash Flood Statements).

Flash Flood Table :
A table of pre-computed forecast crest stage values for small streams for a variety of antecedent moisture conditions and rain amounts. Soil moisture conditions are often represented by flash flood guidance values. In lieu of crest stages, categorical representations of flooding, e.g., minor, moderate, etc. may be used on the tables.

Flash Flood Warning (FFW) :
A warning by the NWS issued to warn of flash flooding that is imminent or occurring.

Flash Flood Watch (FFA) :
A statement by the NWS that alerts communities to the possibility of flash flooding in specified areas.

Flashboards :
A length of timber, concrete, or steel placed on the crest of a spillway to raise the retention water level but which may be quickly removed in the event of a flood by a tripping device, or by deliberately designed failure of the flashboard or its supports.

Float Recording Precipitation gage :
A rain gage where the rise of a float within the instrument with increasing rainfall is recorded. Some of these gages must be emptied manually, while others employ a self-starting siphon to empty old rainfall amounts.

Floc :
A cluster of frazil particles.

Floe :
An accumulation of frazil flocs (also known as a "pan") or a single piece of broken ice.

Flood :

The inundation of a normally dry area caused by high flow, or overflow of water in an established watercourse, such as a river, stream, or drainage ditch; or ponding of water at or near the point where the rain fell. This is a duration type event with a slower onset than flash flooding, normally greater than 6 hours.

Flood Control Storage :

Storage of water in reservoirs to abate flood damage.

Flood Crest :

The maximum height of a flood wave as it passes a location.

Flood Frequency Curve :

(1) A graph showing the number of times per year on the average, plotted as abscissa, that floods of magnitude, indicated by the ordinate, are equaled or exceeded. (2) A similar graph but with recurrence intervals of floods plotted as abscissa.

Flood Loss Reduction Measures :

The strategy for reducing flood losses. There are four basic strategies. They are prevention, property protection, emergency services, and structural projects. Each strategy incorporates different measures that are appropriate for different conditions. In many communities, a different person may be responsible for each strategy.

Flood of Record :

The highest observed river stage or discharge at a given location during the period of record keeping. (Not necessarily the highest known stage.)

Flood Plain :

The portion of a river valley that has been inundated by the river during historic floods.

Flood Plain Information Studies :

Reports usually prepared by the U.S. Army Corps of Engineers (USACE) following a survey of a flood-impacted community.

Flood Potential Outlook (ESF on AFOS) (FPO for Acronym) :

An NWS outlook that is issued to alert the public of potentially heavy rainfall that could send area rivers and streams into flood or aggravate an existing flood.

Flood Prevention :

Measures that are taken in order to keep flood problems from getting worse. Planning, land acquisition, river channel maintenance, wetlands protection, and other regulations all help modify development on flood plains and watersheds to reduce their susceptibility to flood damage. Preventive measures are usually administered by the building, zoning, planning and/or code enforcement offices of the local government.

Flood Problems :

Problems and damages that occur during a flood as a result of human development and actions. Flood problems are a result from: 1) Inappropriate development in the floodplain (e.g., building too low, too close to the channel, or blocking flood flows); 2) Development in the watershed that increases flood flows and creates a larger floodplain, or; 3) A combination of the previous two.

Flood Profile :

A graph of elevation of the water surface of a river in flood, plotted as ordinate, against distance, measured in the downstream direction, plotted as abscissa. A flood profile may be drawn to show elevation at a given time, crests during a particular flood, or to show stages of concordant flows.

Flood Routing :

Process of determining progressively the timing, shape, and amplitude of a flood wave as it moves downstream to successive points along the river.

Flood Stage :

A gage height at which a watercourse overtops its banks and begins to cause damage to any portion of the defined reach. Flood stage is usually higher than or equal to bankfull stage.

Flood Statement (FLS) :

A statement issued by the NWS to inform the public of flooding along major streams in which there is not a serious threat to life or property. It may also follow a flood warning to give later information.

Flood Warning (FLW) :

A release by the NWS to inform the public of flooding along larger streams in which there is a serious threat to life or property. A flood warning will usually contain river stage (level) forecasts.

Flood Wave :

A rise in streamflow to a crest and its subsequent recession caused by precipitation, snow melt, dam failure, or reservoir releases.

Flooded Ice :

Ice which has been flooded by melt water or river water and is heavily loaded by water and wet snow.

Floodproofing :

The process of protecting a building from flood damage on site. Floodproofing can be divided into wet and dry floodproofing. In areas subject to slow-moving, shallow flooding, buildings can be elevated, or barriers can be constructed to block the water's approach to the building. These techniques have the advantage of being less disruptive to the neighborhood. It must be noted that during a flood, a flood proofed building may be isolated and without utilities and therefore unusable, even though it has not been damaged.

Floodwall :

A long, narrow concrete, or masonry embankment usually built to protect land from flooding. If built of earth the structure is usually referred to as a levee. Floodwalls and levees confine streamflow within a specified area to prevent flooding. Ring levees confine streamflow out of an area. The term "dike" is used to describe an embankment that blocks an area on a reservoir or lake rim that is lower than the top of the dam.

Floodway :

(1) A part of the flood plain, otherwise leveed, reserved for emergency diversion of water during floods. A part of the flood plain which, to facilitate the passage of floodwater, is kept clear of encumbrances.(2) The channel of a river or stream and those parts of the flood plains adjoining the channel, which are reasonably required to carry and discharge the floodwater or floodflow of any river or stream.

Flow Duration Curve :

A cumulative frequency curve that shows the percentage of time that specified discharges are equaled or exceeded.

Flowing Artesian Well :

A well drilled into a confined aquifer with enough hydraulic pressure for the water to flow to the surface without pumping.

Forebay :

The water behind (upstream) of the dam.

Forecast Crest :

The highest elevation of river level, or stage, expected during a specified storm event.

Forecast Point :

A location that represents an area (reach of a river), where a forecast is made available to the public. Each NWS river forecast point has an associated E-19a, Abridged Report on River Gage Station, and E-19, Report on River Gage Station.

Foresight :
A sighting on a point of unknown elevation from an instrument of known elevation. To determine the elevation of the point in question, the foresight is subtracted from the height of the instrument. A surveying term.

Fountainhead :
The upper end of a confined-aquifer conduit, where it intersects the land surface.

Fracture :
Any break or rupture formed in an ice cover or floe due to deformation.

Fracture Zone :
An area which has a great number of fractures.

Fracturing :
Deformation process whereby ice is permanently deformed, and fracture occurs.

Frazil Ice :
Fine spicules, plates, or discoids of ice suspended in water. In rivers and lakes, frazil is formed in supercooled, turbulent water.

Frazil Slush :
An agglomerate of loosely packed frazil which floats or accumulates under the ice cover.

Free Ground Water :
Unconfined ground water whose upper boundary is a free water table.

Freeboard :
The vertical distance between the normal maximum level of the water surface in a channel, reservoir, tank, canal, etc., and the top of the sides of a levee, dam, etc., which is provided so that waves and other movements of the liquid will not overtop the confining structure.

Freezeup date :
Date on which the water body was first observed to be completely frozen over.

Freezup jam :
Ice jam formed as frazil ice accumulates and thickens.

French Drain :
An underground passageway for water through the interstices among stones placed loosely in a trench.

Frequency Curve :
A curve that expresses the relation between the frequency distribution plot, with the magnitude of the variables as abscissas and the number of occurrences of each magnitude in a given period as ordinates. The theoretical frequency curve is a derivative of the probability curve.

Friction Head :
The decrease in total head caused by friction.

FTP (File Transfer Protocol) :
A method of data transfer that can take place between Frame Relay Networks, and Workstations.

Gage :
(1) A device for indicating the magnitude or position of a thing in specific units, when such magnitude or position undergoes change, for example: The elevation of a water surface, the velocity of flowing water, the pressure of water, the amount or intensity of precipitation, the depth of snowfall, etc. (2) The act or operation of registering or measuring the magnitude or position of a thing when these characteristics are undergoing change. (3) The operation, including both field and office work, of measuring the discharge of a stream of water in a waterway.

Gage Datum :
The arbitrary zero datum elevation which all stage measurements are made from.

Gage Height :
The water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term stage, although gage height is more appropriate when used with a reading on a gage.

Gage Zero :
The elevation of zero stage. (Same as gage datum.)

Gaging Station :
A particular site on a watercourse where systematic observations of stage and/or flow are measured.

Gallery :
A passageway within the body of a dam or abutment.

Gate :
A device in which a leaf or member is moved across the waterway from an external position to control or stop flow. There are many different kinds of gates used on a dam. Some include: Bulkhead, Crest (or Spillway), Emergency, Fixed Wheel, Flap, Flood, Guard, Outlet, Radial, Regulating, and Slide Gates.

Geohydrology :
That branch of hydrology relating to subsurface, or subterranean waters.

Geophysics :
The study of the physical characteristics and properties of the earth; including geodesy, seismology, meteorology, oceanography, atmospheric electricity, terrestrial magnetism, and tidal phenomena.

Glacier :
Bodies of land ice that consist of recrystallized snow accumulated on the surface of the ground, and that move slowly downslope.

Glacier Dammed Lake :
The lake formed when a glacier flows across the mouth of an adjoining valley and forms an ice dam.

GOES (Geostationary Orbiting Environmental Satellite) :
Satellite orbiting at 22,000 miles above the earth's surface that remains above the same location on the earth. DCPs transmit river and rainfall data to the GOES for relay to a ground-receive site in Wallops Island, VA.

GOES DCS (Data Collection System) :
A data collection system under NESDIS which is comprised of the DCPs, and the NESDIS Command and Data Acquisition (CDA) System components. This satellite-based system collects a variety of environmental data from locations in the Western Hemisphere. The system is a data relay network for more than 10,000 DCPs which transmits data to one of two GOES satellites (East and West). These data are relayed to the NESDIS CDA ground station located at Wallops Island, VA. The data are then relayed over to Silver Springs, MD, where the data is then distributed to the appropriate recipients.

Gravity Dam :
A concrete structure proportioned so that its own weight provides the major resistance to the forces exerted on it.

Ground receive sites :
A satellite dish and associated computer which receives signals from the GOES satellite, decodes the information, and transmits it to a another site for further processing. The GOES satellite ground-receive site is located at Wallops Island, VA; and the information is relayed to a mainframe computer at NWSH for processing.

Ground Water :
Water within the earth that supplies wells and springs; water in the zone of saturation where all openings in rocks and soil are filled, the upper surface of which forms the water table. Also termed Phreatic water.

Grounded ice :
Ice that has run aground or is contact with the ground underneath it.

Ground Water Divide :
A line on a water table where on either side of which the water table slopes downward. It is analogous to a drainage divide between two drainage basins on a land surface.

Ground Water Hydrology :
The branch of hydrology that specializes in ground water; its occurrence and movements; its replenishment and depletion; the properties of rocks that control ground water movement and storage; and the methods of investigation and utilization of ground water.

Ground Water Flow :
Streamflow which results from precipitation that infiltrates into the soil and eventually moves through the soil to the stream channel. This is also referred to as baseflow, or dry-weather flow.

Ground Water Mining :
Pumping ground water from a basin where the safe yield is very small, thereby extracting ground water which had accumulated over a long period of time.

Ground Water Outflow :
That part of the discharge from a drainage basin that occurs through the ground water. The term "underflow" is often used to describe the ground water outflow that takes place in valley alluvium (instead of the surface channel) and thus is not measure at a gaging station.

Ground Water Overdraft :
Pumpage of ground water in excess of safe yield.

Ground Water Runoff :
That part of the runoff which has passed into the ground, has become ground water, and has been discharged into a stream channel as spring, or seepage water.

Grout Curtain :
A barrier produced by injecting grout into a vertical zone, usually narrow (horizontally), and in the foundation to reduce seepage under a dam.

HADS (Hydrometeorological Automated Data System) :
Software that replaced GDDS to process and distribute the GOES DCP data and CADAS data collected from DCP's and LARCS.

Hanging (ice) dam :
A mass of ice composed mainly of frazil or broken ice deposited underneath an ice cover in a region of low flow velocity.

HDRAIN :
An Hourly Digital Rainfall Product of the WSR-88D.

Head :
The difference between the pool height and tailwater height. Usually expressed in feet of head, or in lbs./sq. inch.

Head Loss :
The decrease in total head caused by friction, entrance and exit losses.

Head Race :
A channel which directs water to a water wheel; a forebay.

Headward Erosion :
Erosion which occurs in the upstream end of the valley of a stream, causing it to lengthen its course in such a direction.

Headwaters :
Streams at the source of a river.

Headwater Advisory Program (ADVIS) :
A Program which uses the Antecedent Precipitation Index (API) method of estimating runoff, unit hydrograph theory and stage-discharge ratings to produce hydrologic forecasts for headwater basins.

Headwater Advisory Table :
A table developed by a River Forecast Center for a Headwater Guidance Point; a pre-computed matrix of values allows a forecaster to ascertain an anticipated crest or rise on a small river or stream for a variety of rainfall events and soil moisture conditions.

Headwater basin :
A basin at the headwaters of a river. All discharge of the river at this point is developed within the basin.

HIC:
Hydrologist in Charge of an RFC.

HIC:
The Hydrometeorological Information Center of the Office of Hydrology (OH).

Hinge Crack :
Crack caused by significant changes in water level.

HOD :
The Hydrologist on Duty at an RFC.

HOD :
The Hydrologic Operations Division of the Office of Hydrology (OH).

HRL :
The Hydrological Research Laboratory at the Office of Hydrology (OH).

HSA (Hydrologic Service Area) :
A geographical area assigned to Weather Service Forecast Office's/Weather Forecast Office's that embraces one or more rivers.

HSB:
The Hydrologic Systems Branch in the Office of Hydrology (OH).

HTC:
The Hydrometeorological Training Council.

Hummock :
A hillock of broken ice which has been forced upward by pressure.

Hummocked Ice :
Ice piled haphazardly one piece over another to form an uneven surface.

Hydraulic Fill Dam :
A dam constructed of materials, often dredged, that are conveyed and placed by suspension in flowing water.

Hydraulic Grade Line :

A line whose plotted ordinate position represents the sum of pressure head plus elevation head for the various positions along a given fluid flow path, such as along a pipeline or a ground water streamline. In open channels, the hydraulic grade line is equal to the water surface.

Hydraulic Head :

(1) The height of the free surface of a body of water above a given point beneath the surface. (2) The height of the water level at the headworks, or an upstream point, of a waterway, and the water surface at a given point downstream. (3) The height of a hydraulic grade line above the center line of a pressure pipe, at a given point.

Hydraulic Mean Depth :

The right cross-sectional area of a stream of water divided by the length of that part of its periphery in contact with its containing conduit; the ratio of area to wetted perimeter. Also called Hydraulic Radius.

Hydraulic Permeability :

The flow of water through a unit cross-sectional area of soil normal to the direction of flow when the hydraulic gradient is unity.

Hydraulic Radius :

The right cross-sectional area of a stream of water divided by the length of that part of its periphery in contact with its containing conduit; the ratio of area to wetted perimeter. Also called Hydraulic Mean Depth.

Hydrograph :

A graph showing the water level (stage), discharge, or other property of a river volume with respect to time.

Hydrograph Separation :

The process where the storm hydrograph is separated into baseflow components and surface runoff components.

Hydrographic Survey :

An instrumental survey to measure and determine characteristics of streams and other bodies of water within an area, including such things as location, areal extent, and depth of water in lakes or the ocean; the width, depth, and course of streams; position and elevation of high water marks; location and depth of wells, etc.

Hydrologic Budget :

An accounting of the inflow to, outflow from, and storage in, a hydrologic unit, such as a drainage basin, aquifer, soil zone, lake, reservoir, or irrigation project.

Hydrologic Cycle :

The natural pathway water follows as it changes between liquid, solid, and gaseous states.

Hydrologic Equation :

The water inventory equation (Inflow = Outflow + Change in Storage) which expresses the basic principle that during a given time interval the total inflow to an area must equal the total outflow plus the net change in storage.

Hydrologic Model :

A conceptual or physically-based procedure for numerically simulating a process or processes which occur in a watershed.

Hydrologic Service Area (HSA) :

A geographical area assigned to Weather Service Forecast Office's/Weather Forecast Office's that embraces one or more rivers.

Hydrologic Services :

A general term referring to the operations, products, verbal communications, and related forms of support provided by the NWS for the Nation’s streams, reservoirs, and other areas affected by surface water.

Hydrologic Unit :
A geographical area representing part or all of a surface drainage basin or distinct hydrologic feature such as a reservoir, lake, etc.

Hydrology :
The applied science concerned with the waters of the earth, their occurrences, distribution, and circulation through the unending hydrologic cycle of: precipitation, consequent runoff, infiltration, and storage; eventual evaporation; and so forth. It is concerned with the physical and chemical reaction of water with the rest of the earth, and its relation to the life of the earth.

Hydrometeorological Technicians :
Individuals whose duties include data collection, quality control, gage network maintenance, as well as the gathering and disseminating of data and products at NWS Forecast Offices.

Hydrologists :
Individuals who study the applied science of hydrology and solve hydrologic problems. This study includes the occurrence, distribution, and circulation of water through the unending hydrologic cycle of: precipitation, consequent runoff, infiltration, and storage; as well as evaporation. It is concerned with the physical and chemical reaction of water with the rest of the earth, and its relation to the life of the earth.

Hydrosphere :
The region that includes all the earth's liquid water, frozen water, floating ice, frozen upper layer of soil, and the small amounts of water vapor in the earth's atmosphere.

Hydrostatic Head :
A measure of pressure at a given point in a liquid in terms of the vertical height of a column of the same liquid which would produce the same pressure.

Hyetograph :
A graphical representation of rainfall intensity with respect to time.

Ice Boom :
A floating structure designed to retain ice.

Ice Bridge :
A continuous ice cover of limited size extending from shore to shore like a bridge.

Ice Gorge :
The gorge or opening left in a jam after it has broken.

Ice jam :
A stationary accumulation that restricts or blocks streamflow.

Ice Push :
Compression of an ice cover particularly at the front of a moving section of ice cover.

Ice Run :
Flow of ice in a river. An ice run may be light or heavy, and may consist of frazil, anchor, slush, or sheet ice.

Ice Twitch :
Downstream movement of a small section of an ice cover. Ice twitches occur suddenly and often appear successively.

Ice Shove :
On-shore ice push caused by wind, and currents, changes in temperature, etcetera.

IFLOWS :
The Integrated Flood Observing and Warning System.

Impermeable :
Material that does not permit fluids to pass through it.

Impervious :
The ability to repel water, or not let water infiltrate.

Import :
Water piped or channeled into an area.

Inactive Storage Capacity :
The portion of capacity below which the reservoir is not normally drawn, and which is provided for sedimentation, recreation, fish and wildlife, aesthetic reasons, or for the creation of a minimum controlled operational or power head in compliance with operating agreements or restrictions.

Inch-Degrees :
The product of inches of rainfall multiplied by the temperature in degrees above freezing (Fahrenheit Scale), used as a measure of the snowmelting capacity of rainfall.

Inches of Runoff :
The volume of water from runoff of a given depth over the entire drainage.

Inclined Staff Gage :
A staff gage that is placed on the slope of a stream bank and graduated so that the scale reads directly in vertical depth.

Index of Wetness :
The ratio of precipitation for a given year over the mean annual precipitation.

Indirect Flood Damage :
Expenditures made as a result of the flood (other than repair) such as relief and rescue work, removing silt and debris, etc.

Industrial Consumption :
The quantity of water consumed in a municipality or district for mechanical, trade, and manufacturing purposes, in a given period, generally one day. The per capita use is generally based on the total population of the locality, municipality, or district.

Infiltration :
Movement of water through the soil surface into the soil.

Infiltration Capacity :
The maximum rate at which water can enter the soil at a particular point under a given set of conditions.

Infiltration Capacity Curve :
A graph showing the time-variation of infiltration capacity. A standard infiltration capacity curve shows the time-variation of the infiltration rate which would occur if the supply were continually in excess of infiltration capacity.

Infiltration Index :
An average rate of infiltration, in inches per hour, equal to the average rate of rainfall such as that the volume of rainfall at greater rates equals the total direct runoff.

Infiltration Rate :

(1) The rate at which infiltration takes place expressed in depth of water per unit time, usually in inches per hour. (2) The rate, usually expressed in cubic feet per second, or million gallons per day per mile of waterway, at which ground water enters an infiltration ditch or gallery, drain, sewer, or other underground conduit.

Influent Seepage :

Movement of gravity water in the zone of aeration from the ground surface toward the water table.

Influent Stream :

Any watercourse in which all, or a portion of the surface water flows back into the ground namely the, vadose zone, or zone of aeration.

Initial Detention :

The volume of water on the ground, either in depressions or in transit, at the time active runoff begins.

Initial Loss :

In hydrology, rainfall preceding the beginning of surface runoff. It includes interception, surface wetting, evaporation and infiltration unless otherwise specified.

Initial Moisture Deficiency :

The quantity, usually expressed in depth of water in inches upon a unit area, by which the actual water content of a given soil zone (usually the root zone) in such area is less than the field capacity of such zone at the beginning of the rainy season. Also called Initial Water Deficiency.

Initial Water Deficiency :

The quantity, usually expressed in depth of water in inches upon a unit area, by which the actual water content of a given soil zone (usually the root zone) in such area is less than the field capacity of such zone at the beginning of the rainy season. Also called Initial Moisture Deficiency.

Inland freshwater wetlands :

Swamps, marshes, and bogs found inland beyond the coastal saltwater wetlands.

Instantaneous Unit Hydrograph :

The theoretical, ideal, unit hydrograph that has a infinitesimal duration.

Instream use :

The use of water that does not require withdrawal or diversion from its natural watercourse; for example, the use of water for navigation, recreation, and support of fish and wildlife.

Intangible Flood Damage :

Estimates of the damage done by disruption of business, danger to health, shock, and loss of life and in general all costs not directly measurable which require a large element of judgment for estimating.

Integrated Flood Observing and Warning System (IFLOWS) :

A 1200 baud wide area network utilizing UHF/VHF radio and land line communications; IFLOWS components include rainfall and stage sensors, transceivers, store-forward repeaters and computer base stations.

Interbasin Transfer :

The physical transfer of water from one watershed to another.

Interception Storage Requirements :

Water caught by plants at the onset of a rainstorm. This must be met before rainfall reaches the ground.

Intercepting Drain :

A drain constructed at the upper end of the area to be drained, to intercept surface or ground water flowing toward the protected area from higher ground, and carry it away from the area. Also called Curtain Drain.

Interception :
The process by which precipitation is caught and held by foliage, twigs, and branches of trees, shrubs, and other vegetation, and lost by evaporation, never reaching the surface of the ground. Interception equals the precipitation on the vegetation minus streamflow and through fall.

Interception Storage Requirements :
Water caught by plants at the onset of a rainstorm. This must be met before rainfall reaches the ground.

Interflow :
The lateral motion of water through the upper layers until it enters a stream channel. This usually takes longer to reach stream channels than runoff. This also called subsurface storm flow.

Intermediate Zone :
The subsurface water zone below the root zone and above the capillary fringe.

Intermittent Stream :
A stream that flows periodically. Compare perennial stream.

Inundation Map :
A map delineating the area that would be inundated in the event of a dam failure.

Irrigated Area :
The gross farm area upon which water is artificially applied for the production of crops, with no reduction for access roads, canals, or farm buildings.

Irrigation :
The controlled application of water to arable lands to supply water requirements not satisfied by rainfall.

Irrigation Efficiency :
The percentage of water applied that can be accounted for in soil moisture increase for consumptive use.

Irrigation Requirement :
The quantity of water, exclusive of precipitation, that is required for crop production. It includes surface evaporation and other economically unavoidable wastes.

Isobath :
An imaginary line on the earth's surface or a line on a map connecting all points which are the same vertical distance above the upper or lower surface of a water-bearing formation or aquifer.

Isohyet :
A line that connects points of equal rainfall.

Jetty :
A structure (e.g.; a pier, or mole of wood or stone) extending into a sea, lake, or river to influence the current or tide or to protect a harbor.

Jokulhlaup :
An Icelandic term meaning glacier dammed lake outburst flood.

Juvenile Water :
Water formed chemically within the earth and brought to the surface in intrusive rock.

Lag (of a basin) :
The measure of the time between the center of mass of precipitation to the center of mass of runoff (on the hydrograph); basin lag is a function of not only basin characteristics, but also of storm intensity and movement. Some hydrologic texts define lag from the center of mass of rainfall to the hydrograph peak.

Lag (Time) :
The time it takes a flood wave to move downstream.

Laminar Flow :
Streamline flow in which successive flow particles follow similar path lines and head loss varies with velocity to the first power.

LARC (Limited Automatic Report Collector) :
An electronic device that interfaces a river or precipitation gage with a telephone line making it possible for remote computers to call a gaging site and retrieve data. Eventually LARCs will Replace DARDCs.

Length :
The distance in the direction of flow between two specific points along a river, stream, or channel.

Lentic System :
A nonflowing or standing body of fresh water, such as a lake or pond. Compare lotic system.

Levee (Dike) :
A long, narrow embankment usually built to protect land from flooding. If built of concrete or masonry the structure is usually referred to as a flood wall. Levees and floodwalls confine streamflow within a specified area to prevent flooding. The term "dike" is used to describe an embankment that blocks an area on a reservoir or lake rim that is lower than the top of the dam.

LFWS :
A generic term for any type of Local Flood Warning System.

Limited Automatic Remote Collector (LARC) :
An electronic device that interfaces a river or precipitation gage with a telephone line making it possible for remote computers to call a gaging site and retrieve data.

Limnology :
The branch of hydrology that pertains to the study of lakes.

Lining :
A coating of concrete, rubber, or plastic to a canal, tunnel, shaft or reservoir to provide water-tightness, prevent erosion, reduce friction, or support the periphery of the structure.

Lithosphere :
That part of the earth which is composed predominantly of rocks (either coherent or incoherent, and including the disintegrated rock materials known as soils and subsoils), together with everything in this rocky crust.

Littoral Zone :
The area on, or near the shore of a body water.

Live Capacity :
The total amount of storage capacity available in a reservoir for all purposes, from the dead storage level to the normal water or normal pool level surface level. Does not include surcharge, or dead storage, but does include inactive storage, active conservation storage and exclusive flood control storage.

Local Flooding :
Flooding conditions over a relatively limited (localized) area.

Local Flood Warning System (LWFS) :
A general designator for a network of stream and rain gages implemented by a community or local government to monitor hydrologic events as they occur. LFWS gages are either read manually by spotters or fitted with radio transmitter to communicate data to a computerized base station (see IFLOWS and ALERT).

Log and Safety Boom :

A net-like device installed in a reservoir, upstream of the principal spillway, to prevent logs, debris and boaters from entering a water discharge facility or spillway.

Long Term Storage Dams :

Reservoirs used for recreational use or storage of irrigation, municipal or industrial water. Because water is impounded on a "permanent" basis, the design of these dams is more complex than for tailings or flood control detention dams. A long term storage dam may include an impermeable core surrounded by shell material, have many types of drains and filters, outlet works, with gates and valves, seepage collection boxes, and possibly several spillways. The capacity of the spillway is dependant upon the downstream hazard potential.

Lotic System :

A flowing body of fresh water, such as a river or stream. Compare lentic system.

Lowland Flooding :

Inundation of low areas near the river, often rural, but may also occur in urban areas.

Lysimeter :

A device to measure the quantity or rate of downward water movement through a block of soil usually undisturbed, or to collect such percolated water for analysis as to quality.

Main Stem :

The reach of a river/stream formed by the tributaries that flow into it.

Major Flooding :

A general term including extensive inundation and property damage. (Usually characterized by the evacuation of people and livestock and the closure of both primary and secondary roads.)

MAP (Mean Areal Precipitation) :

The average rainfall over a given area, generally expressed as an average depth over the area.

Mass Curve :

A graph of the cumulative values of a hydrologic quantity (such as precipitation or runoff), generally as ordinate, plotted against time or date.

Maximum Spillway Discharge :

Spillway discharge (cfs) when reservoir is at maximum designed water surface elevation.

Mean Depth :

The average depth of water in a stream channel or conduit. It is equal to the cross-sectional area divided by the surface width.

Meander :

The winding of a stream channel.

Meander Belt :

The area between lines drawn tangential to the extreme limits of fully developed meanders.

Meniscus :

The curved surface of the liquid at the open end of a capillary column.

Meteoric Water :

Water derived from precipitation.

Miners' Inch :

A rate of discharge through an orifice one inch square under a specific head.

Minor Flooding :
A general term indicating minimal or no property damage but possibly some public inconvenience.

Mission of the Hydrologic Services Program :
To provide river and flood forecasts and warnings for the protection of life and property and to provide basic hydrologic forecast information for the Nation's economic and environmental well being.

Moderate Flooding :
The inundation of secondary roads; transfer to higher elevation necessary to save property -- some evacuation may be required.

Moisture Equivalent :
The ratio of (1) the weight of water which the soil, after saturation, will retain against a centrifugal force 1,000 times the force of gravity, to (2) the weight of the soil when dry. The ratio is stated as a percentage.

Movable Bed :
A stream bed made up of materials readily transportable by the stream flow.

Moveable Bed Streams :
These are most common in the arid West, where steep slopes and lack of vegetation result in a lot of erosion. During a flood, a channel may be eroded more deeply, or it may become filled with sediment and move to a different location.

Multipurpose Reservoir :
A reservoir constructed and equipped to provide storage and release of water for two or more purposes such as flood control, power development, navigation, irrigation, recreation, pollution abatement, domestic water supply, etc.

Municipal Use of Water :
The various uses of water in developed urban areas, including domestic use, industrial use, street sprinkling, fire protection, etc. The term is an inclusive one, applied where the uses are varied.

Natural Control :
A stream gaging control which is natural to the stream channel, in contrast to an artificial control structure by man.

Navigation Methods :
Three basic methods of providing and managing inland waterways - 1) Run-of-the-River: no provision of upstream storage; 2) Slack-Water: locks and dams provide slack water or pools with adequate depth for the draft of heavy barges and area to prevent excessive velocities; 3) Canalization: in lieu of a series of dams on the river a canal with locks adjoins the river.

NCCF :
NOAA Central Computer Facility

National Environmental Satellite, Data, and Information Service (NESDIS) :
NESDIS collects, processes, stores, analyzes, and disseminates various types of hydrologic, meteorologic, and oceanic data. NESDIS is also responsible for the development of analytical and descriptive products so as to meet the needs of it's users.

Net Rainfall :
The portion of rainfall which reaches a stream channel or the concentration point as direct surface flow.

NOHRSC:
The National Operational Hydrologic Remote Sensing Center. An organization under the National Weather Service Office of Hydrology (OH) that mainly deals with snow mapping.

Normal Water Surface Elevation (Normal Pool Level) :
The lowest crest level of overflow on a reservoir with a fixed overflow level (spillway crest elevation). For a reservoir whose outflow is controlled wholly or partly by movable gates, siphons, or other means, it is the maximum level to which water may rise under normal operating conditions, exclusive of any provision for flood surcharge.

Normal Year :
A year during which the precipitation or stream flow approximates the average for a long period of record.

NRCS:
National Resources Conservation Services

NWSH :
National Weather Service Headquarters.

NWSRFS V5.0, or Version 5 (National Weather Service River Forecast Model Version 5) :
The system of data entry, data preprocessing, and forecast programs which are used by RFCs. To make river forecasts, RFCs run NWSRFS V5.0 on a mainframe computer in NWSH through Remote Job Entry, or locally via Government Development Platforms, GDPs.

Observation Well :
A non-pumping well used for observing the elevation of the water table or piezometric surface.

Ogee :
A reverse curve, shaped like an elongated letter S. The downstream faces of overflow dams are often made to this shape. (From the French word Ogive).

OH :
The Office of Hydrology, located in Silver Springs, MD.

OML :
An Operations Manual Letter. These serve as updates to policy and procedure for the NWService Operations Manual (WSOM).

One Percent Chance Flood (One Hundred Year Flood) :
Flood magnitude that has one chance in 100 of being exceeded in any future 1-year period. The occurrence of floods is assumed to be random in time, or regularity of occurrence is implied. The exceeding of a 1-percent chance is no guarantee, therefore, that a similar size flood will not occur next week. The risk of experiencing a large flood within time periods longer than 1 year increases in a nonadditive fashion. For example, the risk of exceeding a 1-percent chance flood one or more times during a 30-year period is 25 percent and during a 70-year period is 50 percent.

Orifice :
(1) An opening with closed perimeter, usually sharp edged, and of regular form in a plate, wall, or partition through which water may flow, generally used for the purpose of measurement or control of water. (2) The end of a small tube, such as a Pitot tube, piezometer, etc.

Orographic Precipitation :
Precipitation which is caused by hills or mountain ranges deflecting the moisture-laden air masses upward, causing them to cool and precipitate their moisture.

Outburst Flood :
See Jokulhlaup.

Outflow Channel :
A natural stream channel which transports reservoir releases.

Outlet :
An opening through which water can be freely discharged from a reservoir.

Outlet Discharge Structure :
Protects the downstream end of the outlet pipe from erosion and is often designed to slow down the velocity of released water to prevent erosion of the stream channel.

Overland Flow :
The flow of rainwater or snowmelt over the land surface toward stream channels. After it enters a watercourse it becomes runoff.

Palmer Drought Severity Index :
An index whereby excesses or deficiencies of precipitation are determined in relation to average climate values. The index takes in to account precipitation, potential and actual Evapotranspiration, infiltration of water into the soil, and runoff.

Parametric Data :
Data such as rating curves, unit hydrographs, and rainfall/runoff curves which define hydrologic variables in models.

Parapet Wall :
A solid wall built along the top of the dam for ornament, safety, or to prevent overtopping.

Partial-Duration Flood Series :
A list of all flood peaks that exceed a chosen base stage or discharge, regardless of the number of peaks occurring in a year. Generally however, selected to result in one per year on average, with some years having none and others having several.

Pancake Ice :
Circular flat pieces of ice with a raised rim; the shape and rim are due to repeated collisions.

Peak Discharge :
Highest rate of discharge of a volume of water passing a given location during a given period of time (during the year, or a flood event, etc..).

Perched Groundwater :
Local saturated zones above the water table which exist above an impervious layer of limited extent.

Perched Water Table :
The water table of a relatively small ground-water body supported above the general ground water body.

Percolation :
The movement of water, under hydrostatic pressure, through the interstices of a rock or soil, except the movement through large openings such as caves.

Percolation Deep :
In irrigation or farming practice, the amount of water that passes below the root zone of the crop or vegetation.

Percolation Path :
The course followed by water moving or percolating through any other permeable material, or under a dam which rests upon a permeable foundation.

Percolation Rate :
The rate, usually expressed as a velocity, at which water moves through saturated granular material. The term is also applied to quantity per unit of time of such movement, and has been used erroneously to designate Infiltration Rate or Infiltration Capacity.

Perennial Stream :

A stream that flows all year round. Compare intermittent stream.

Permanent Control :

A stream gaging control which is substantially unchanging and is not appreciably affected by scour, fill, or backwater.

Permanent Monument :

Fixed monuments placed away from the dam which allow movements in horizontal and vertical control points on the dam to be monitored by using accurate survey procedures.

Permeability :

The ability of a material to transmit fluid through its pores when subjected to a difference in head.

Permeability Coefficient :

The rate of flow of a fluid through a cross section of a porous mass under a unit hydraulic gradient, at a temperature of 60 degrees Fahrenheit. The standard coefficient of permeability used in hydrologic work in Meinzer's Units is defined as the rate of flow of water at 60 degrees Fahrenheit, in gallons per day, through a cross section of 1 sq. ft., under a hydraulic gradient of 100%. A related coefficient, which may be called the Field Coefficient of Permeability, is defined as the rate of flow of water, in gallons a day, under prevailing conditions, through each foot of thickness of a given aquifer in a width of 1 mile, for each foot per mile of hydraulic gradient.

Permeameter :

A laboratory instrument for determining permeability by measuring the discharge through a sample of the material when a known hydraulic head is applied.

Pervious Zone :

A part of the cross section of an embankment dam comprising material of high permeability.

Piezometer :

An instrument used to measure pressure head in a conduit, tank, soil, etc. They are used in dams to measure the level of saturation.

Phreatic surface :

The free surface of ground water at atmospheric pressure.

Phreatic water :

Water within the earth that supplies wells and springs; water in the zone of saturation where all openings in rocks and soil are filled, the upper surface of which forms the water table. Also termed Groundwater.

Phreatic Zone :

The locus of points below the water table where soil pores are filled with water. This is also called the zone of saturation.

Phreatophyte :

A plant that habitually obtains its water supply from the zone of saturation, either directly or through the capillary fringe.

Piezometer :

An instrument for measuring pressure head in a conduit, tank, soil, etc. It usually consists of a small pipe or tube tapped into the side of the container, the inside end being flush with, and normal to, the water face of the container, connected with a manometer pressure gage, mercury of water column, or other device for indicating pressure head.

Piezometric Level (or Surface) :

Confined groundwater is usually under pressure because of the weight of the overburden and the hydrostatic head. If a well penetrates the confining layer, water will rise to this level, the piezometric level, the artesian

equivalent of the water table. If the piezometric level is above ground level, the well discharges as a flowing well, artesian well, or a spring.

Piping :
The progressive development of internal erosion by seepage, appearing downstream as a hole or seam discharging water that contains soil particles.

Pitot Tube :
A device for measuring the velocity of flowing water using the velocity head of the stream as an index of velocity. It consists essentially of an orifice held to a point upstream in the water, connected with a tube in which the rise of water due to velocity head may be observed and measured. It also may be constructed with an upstream and downstream orifice, with two water columns, in which case the difference in height of water column in the tubes is the index of velocity.

Pluvial :
In hydrology, anything that is brought about directly by precipitation.

Point Discharge :
Instantaneous rate of discharge, in contrast to the mean rate for an interval of time.

Point Precipitation :
Precipitation at a particular site, in contrast to the mean precipitation over an area.

Pondage :
(1) The holding back of water for later release for power development above the dam of a hydroelectric plant to (a) equalize daily or weekly fluctuations of streamflow or (b) to permit irregular hourly use of water by the wheels to care for fluctuations in the load demand. (2) In general the holding back of water for later releases. (3) The storage capacity available for the use of such water.

Ponding :
In flat areas, runoff collects, or ponds in depression and cannot drain out. Flood waters must infiltrate slowly into the soil, evaporate, or be pumped out.

Pool Height :
The height of the water behind a dam. (Various datums may be used and various pool heights may be used, e.g., conservation pool, flood control pool, etc.)

Pore Pressure :
The interstitial pressure of water within a mass of soil, rock, or concrete.

Porosity :
The ratio of openings (voids) to the total volume of soil or rock.

Precipitation :
As used in hydrology, precipitation is the discharge of water, in a liquid or solid state, out of the atmosphere, generally onto a land or water surface. It is the common process by which atmospheric water becomes surface, or subsurface water. The term "precipitation" is also commonly used to designate the quantity of water that is precipitated. Precipitation includes rainfall, snow, hail, and sleet, and is therefore a more general term than rainfall.

Precipitation Processing System :
The WSR-88D system that generates 1-hour running, 3-hourly, and running storm total precipitation accumulations. Five functional steps are performed to calculate the best estimate of precipitation: 1) development of a sectorized hybrid scan, 2) conversion to precipitation rate, 3) precipitation accumulation, 4) adjustment using rain gages, 5) product update.

Pressure Head :
Energy contained by fluid because of its pressure, usually expressed in feet of fluid (foot pounds per pound).

Pressure Gage :

A device for registering the pressure of solids, liquids, or gases. It may be graduated to register pressure in any units desired.

Pressure Relief Pipes :

Pipes used to relieve uplift or pore pressure in a dam foundation or in the dam structure.

Price Current Meter :

A current meter with a series of conical cups fastened to a flat framework through which a pin extends. The pin sets in the framework of the meter, and the cups are rotated around it in a horizontal plane by the flowing water, registering the number of revolutions by acoustical or electrical devices, from which the velocity of the water may be computed.

Probabilistic Quantitative Precipitation Forecast (PQPF) :

A form of QPF (see below) that includes an assigned probability of occurrence for each numerical value in the forecast product.

Profile :

A graph showing variation of elevation with distance along a traverse.

Property Protection :

Measures that are undertaken usually by property owners in order to prevent, or reduce flood damage. Property protection measures are often inexpensive for the community because they are implemented by or cost-shared with property owners. In many cases the buildings' appearance or use is unaffected, so these measurements are particularity appropriate for historical sites and landmarks. These measures include relocation and acquisition, flood proofing, and buying flood insurance.

Puddle :

(1) The act of compacting earth, soil clay, etc., by mixing them with water and rolling or tamping the mixture. (2) A compact mass of earth, soil, clay, or a mixture of material, which has been compacted through the addition of water, rolling and tamping. This makes the material less permeable. (3) A small pool of water, usually a few inches in depth and from several inches to several feet in it greatest dimension.

Pumping Head :

Energy given to a fluid by a pump, usually expressed in feet of fluid (foot pounds per pound).

QPF (Quantitative Precipitation Forecast) :

A spatial and temporal precipitation forecast that will predict the potential amount of future precipitation for a specified region, or area.

Radioisotope Snow Gage :

A snow water equivalent gage based on the absorption of gamma radiation by snow; this gage can measure up to 55 inches water equivalent with a 2 to 5 percent error.

Rating Curve :

A graph showing the relationship between the stage, usually plotted vertically (Y-axis) and the discharge, usually plotted horizontally (X-axis).

Rating Table :

A table of stage values and the corresponding discharge for a river gaging site.

Reach :

The distance between two specific points outlining that portion of the stream, or river for which the forecast applies. This generally applies to the distance above and below the forecast point for which the forecast is valid.

Recession Constant :
Constant used to reduce the API value daily in the API method of estimating runoff.

Recurrence Interval :
The average amount of time between events of a given magnitude. For example, there is a 1% chance that a 100-year flood will occur in any given year.

Reference Mark :
A relatively permanent point of known elevation which is tied to a benchmark.

Reflectivity :
The measure of the efficiency of a radar target in intercepting and returning Electro Magnetic Energy. Reflectivity depends upon the size, shape, aspect and dielectric properties at the surface of the target.

Regulatory Floodway :
Some maps show an area where construction regulations require special provisions to account for this extra hazard. This is a regulatory floodway.

Remote Observing System Automation (ROSA) :
A type of automated data transmitter used by NWS Cooperative Program observers.

Reservoir :
A man-made facility for the storage, regulation and controlled release of water.

Reservoir Surface Area :
The surface area of a reservoir when filled to the normal pool or water level.

Reservoir Volume :
The volume of a reservoir when filled to normal pool or water level.

Response Time :
The amount of time in which it will take a watershed to react to a given rainfall event.

RFC (River Forecast Center) :
Centers that serve groups of Weather Forecast Offices, in providing hydrologic guidance and is the first echelon office for the preparation of river and flood forecasts and warnings.

Ridge :
A line or wall of broken ice forced up by pressure. May be fresh or weathered.

Ridge Ice :
Ice piled haphazardly one piece over another in the form of ridges or walls.

Riparian Zone :
A stream and all the vegetation on its banks.

River Basin :
Drainage area of a river and its tributaries.

River Flooding :
The rise of a river to an elevation such that the river overflows its natural banks causing or threatening damage.

River Forecast (RVF) :
An internal product issued by RFCs to other NWS offices. An RVF contains stage and/or flow forecasts for specific locations based on existing, and forecasted hydrometeorologic conditions. The contents of these products are used by the HSA office to prepare Flood Warnings (FLW), Flood Statements (FLS), River Statements (RVS), as well as other products available to the public.

River Gage :
A device for measuring the river stage.

River Gage Datum :
The arbitrary zero datum elevation which all stage measurements are made from.

River Ice Statement (RVI) :
A public product issued by the RFC's containing narrative and numeric information on river ice conditions.

River Observing Station :
An established location along a river designated for observing and measuring properties of the river.

River Recreation Statement (RVR) :
A statement released by the NWS to inform river users of current and forecast river and lake conditions. These statements are especially useful for planning purposes.

River Statement (RVS) :
A product issued to communicate notable hydrologic conditions which do not involve flooding, i.e., within river bank rises, minor ice jams, etc.

River Summary (RVA) :
A NWS summary of river and/ or crest stages for selected forecast points along the river.

River System :
All of the streams and channels draining a river basin.

Rockfill Dam :
An embankment dam of earth or rock in which the material is placed in layers and compacted by using rollers or rolling equipment. Same as Rolled Filled Dam.

Rod :
A graduated staff used in determining the difference in elevation between two points. The two most common types of rods are the Philadelphia Rod, graduated in feet and hundredths of a foot, and a California Rod, graduated in feet, inches, and eights of an inch.

Rolled Filled Dam :
An embankment dam of earth or rock in which the material is placed in layers and compacted by using rollers or rolling equipment. Same as Rockfill dam.

ROML :
Regional Operations Manual Letter. These serve as updates to regional policy and procedure for the National Weather Service Operations Manual (WSOM).

ROSA :
Remote Observation System Automation

Rotten Ice :
Ice in an advanced stage of disintegration.

Routing :
The methods of predicting the attenuation of a flood wave as it moves down the course of a river.

Runoff :
That part of precipitation that flows toward the streams on the surface of the ground or within the ground. Runoff is composed of baseflow and surface runoff.

Sacramento Soil Moisture Accounting Model (SACSMA) :
A hydrologic model which simulates the movement and occurrence of water in and on top of the ground.

Satellite Hydrology Program :
A NOHRSC program that uses satellite data to generate areal extent of snow cover data over large areas of the western United States.

SCS :
The Soil Conservation Service, now known as the NRCS (National Resources Conservation Services).

SDM :
Station Duty Manual

Second-Day Feet :
The volume of water represented by a flow of one cubic foot per second for 24 hours; equal to 84,000 cubic feet. This is used extensively as a unit of runoff volume. Often abbreviated as SDF.

Sediment Storage Capacity :
The volume of a reservoir planned for the deposition of sediment.

Seepage :
The interstitial movement of water that may take place through a dam, its foundation, or abutments.

Service Hydrologist :
The designated expert of the hydrology program at a WFO.

Sheet Flow :
Flow that occurs overland in places where there are no defined channels, the flood water spreads out over a large area at a uniform depth. This also referred to as overland flow.

SHEF (Standard Hydrologic Exchange Format) :
A documented set of rules for coding data for operational day-to-day use in a form for both visual and computer recognition.

SHEFPARS :
A software decoder for SHEF Data.

Shore ice :
An ice sheet in the form of a long border attached to the bank or shore; border ice.

Site-Specific :
Term used in conjunction with "forecast" or "warning" to convey the fact that a hydrologic (stream) forecast is produced for an individual stream gage location as opposed to a general area (e.g., a city, zone, or county) as is commonly done in many types of weather forecasts.

Site Specific Hydrologic Prediction System (SSHP) :
The WFO hydrologic forecast model for small rivers and streams that uses RFC soil moisture state variables, stage and precipitation data. Routing capabilities may be added to future builds.

SMA :
The Soil Moisture Accounting Model.

Small Stream Flooding :
Flooding of small creeks, streams, or runs.

SMPDBK :
The Simplified Dam Break (DAMBRK) Model.

Snow Accumulation and Ablation Model :
A model which simulates snow pack accumulation, heat exchange at the air-snow interface, areal extent of snow

cover, heat storage within the snow pack, liquid water retention, and transmission and heat exchange at the ground-snow interface.

Snow Core :
A sample of either freshly fallen snow, or the combined old and new snow on the ground. This is obtained by pushing a cylinder down through the snow layer and extracting it.

Snow Density :
The mass of snow per unit volume which is equal to the water content of the snow divided by its depth.

Snow Depth :
The combined total depth of both the old and new snow on the ground.

Snow Pillow :
An instrument used to measure snow water equivalents. Snow pillows typically have flat stainless steel surface areas. The pillow below this flat surface is filled with antifreeze solution and the pressure in the pillow is related to the water-equivalent depth of the snow on the platform. One great advantage of snow pillows over a snow survey is the frequency of observations, which can be as high as twice per day.

Snow Stake :
A 1-3/4 inch square, semi-permanent stake, marked in inch increments to measure snow depth.

Snow Stick :
A portable rod used to measure snow depth.

SNOw TELemetry (SNOTEL) :
An automated network of snowpack data collection sites. The Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service (SCS), has operated the Federal-State-Private Cooperative Snow Survey Program in the western United States since 1935. A standard SNOTEL site consists of a snow pillow, a storage type precipitation gage, air temperature sensor and a small shelter for housing electronics.

Snow Water Equivalent :
The water content obtained from melting accumulated snow.

Snowboard :
A flat, solid, white material, such as painted plywood, approximately two feet square, which is laid on the ground, or snow surface by weather observers to obtain more accurate measurements of snowfall and water content.

Snowmelt Flooding :
Flooding caused primarily by the melting of snow.

Snowpack :
The total snow and ice on the ground, including the new snow, the previous snow and ice which has not melted.

Soil Conservation Service :
The former name of a branch of the United States Department of Agriculture, renamed the Natural Resources Conservation Service (NRCS). NRCS has responsibilities in soil and water conservation, and flood prevention.

Soil Moisture :
Water contained in the upper regions near the earth's surface.

Specific Yield :
The ratio of the water which will drain freely from the material to the total volume of the aquifer formation. This value will always be less than the porosity.

Spillway :
A structure over or through which excess or flood flows are discharged. If the flow is controlled by gates, it is a controlled spillway, if the elevation of the spillway crest is the only control, it is an uncontrolled spillway. Some

various types of spillways include : Auxiliary or Emergency Spillway : A secondary spillway designed to operate only during exceptionally large flood flows. Allows inflows from large storms to be released from the reservoir before the water level raises high enough to overtop the dam. Fuse Plug Spillway : An auxiliary or emergency spillway comprising a low embankment or a natural saddle designed to be overtopped and eroded away during flood flows.

Primary (or Principal) Spillway : The spillway which would be used first during normal inflow and flood flows.
Shaft or Morning Glory Spillway : A vertical or inclined shaft into which flood water spills and then is conducted through, under, or around a dam by means of a conduit or tunnel. If the upper part of the shaft is splayed out and terminates in a circular horizontal weir, it is termed a "bellmouth" or "morning glory" spillway.
Side Channel Spillway : A spillway whose crest is roughly parallel to the channel immediately downstream of the spillway.
Siphon Spillway : A spillway with one or more siphons built at crest level. This type of spillway is sometimes used for providing automatic surface-level regulation within narrow limits or when considerable discharge capacity is necessary within a short period of time.

Spillway Crest :
The elevation of the highest point of a spillway.

Spring :
An issue of water from the earth; a natural fountain; a source of a reservoir of water.

Staff Gage :
A vertical staff graduated in appropriate units which is placed so that a portion of the gage is in the water at all times. Observers read the river stage off the staff gage.

Stage :
The level of the water surface above a given datum at a given location.

Stage I Precipitation Processing :
The first level of precipitation processing, occurring within the WSR-88D computer and performed for each volume scan of the radar. Base reflectivity data are converted to a precipitation estimate for each grid in the radar umbrella using a complex algorithm that includes quality control procedures, a Z/R relationship, and a bias adjustment using data from a ground-based precipitation gage network. Several graphical and digital products are produced for Weather Forecast Office (WFO) operations and subsequent processing.

Stage II Precipitation Processing :
The second level of precipitation processing, occurring within the WFO Advanced Weather Interactive Processing System (AWIPS) and performed on an hourly basis. Stage I precipitation estimates are further refined using data from additional precipitation gages and other sources such as rain/no rain determinations from satellite imagery. Stage II may also be executed at RFCs for backup purposes.

Stage III Precipitation Processing :
The third level of precipitation processing, performed interactively at RFCs. Stage II precipitation estimates from multiple radars are mosaiced into an RFC area-wide product for use in river basin hydrologic modeling operations. RFC forecasters can review the mosaiced product, interactively edit areas of bad data, and substitute gage-only fields into portions of the mosaiced radar based product.

Stage IV Precipitation Processing :
The fourth level of precipitation processing, performed automatically and/or interactively at NCEP. Stage III precipitation estimates from RFCs are mosaiced into a Nation-wide product for use in various real-time forecast activities and forecast verification operations.

Stair Stepping :
The process of continually updating river forecasts for the purpose of incorporating the effects rain that has fallen since the previous forecast was prepared. The goal of using QPF is to minimize "stair-stepping."

Stilling Basin :
A basin constructed to dissipate the energy of fast-flowing water (e.g., from a spillway or bottom outlet), and to protect the streambed from erosion.

Stoplogs :
Large logs, timbers or steel beams placed on top of each other with their ends held in guides on each side of a channel or conduit providing a temporary closure versus a permanent bulkhead gate.

Storage :
(1) Water artificially impounded in surface or underground reservoirs for future use. (2) Water naturally detained in a drainage basin, such as ground water, channel storage, and depression storage.

Storage Equation :
The equation for the conservation of mass.

Storm Hydrograph :
A hydrograph representing the total flow or discharge past a point.

Stormwater Discharge :
Precipitation that does not infiltrate into the ground or evaporate due to impervious land surfaces but instead flows onto adjacent land or water areas and is routed into drain/sewer systems.

Stream Gage :
A site along a stream where the stage (water level) is read either by eye or measured with recording equipment.

Stream Segment :
Refers to the surface waters of an approved planning area exhibiting common hydrological, natural, physical, biological, or chemical processes. Segments will normally exhibit common reactions to external stresses such as discharge or pollutants.

Streamflow :
Water flowing in the stream channel. It is often used interchangeably with discharge.

Subsidence :
Sinking down of part of the earth's crust due to underground excavation, such as the removal of groundwater.

Substation :
A location where observations are taken or other services are furnished by people not located at NWS offices who do not need to be certified to take observations.

Subsurface Storm Flow :
The lateral motion of water through the upper layers until it enters a stream channel. This usually takes longer to reach stream channels than runoff. This also called interflow.

Surcharge Capacity :
The volume of a reservoir between the maximum water surface elevation for which the dam is designed and the crest of an uncontrolled spillway, or the normal full-pool elevation of the reservoir with the crest gates in the normal closed position.

Surface Impoundment :
An indented area in the land's surface, such as a pit, pond, or lagoon.

Surface Runoff :
The runoff that travels overland to the stream channel. Rain that falls on the stream channel is often lumped with this quantity.

Surface Water :
Water that flows in streams and rivers and in natural lakes, in wetlands, and in reservoirs constructed by humans.

Sustained Overdraft :
Long-term withdrawal from the aquifer of more water than is being recharged.

SWE :
Snow Water Equivalent

Tailwater Height :
Height of water immediately downstream of the dam. (Various datums may be used.)

Thalweg :
The line of maximum depth in a stream. The thalweg is the part that has the maximum velocity and causes cutbanks and channel migration.

Theodolite :
An instrument used in surveying to measure horizontal and vertical angles with a small telescope that can move in the horizontal and vertical planes.

Threshold Runoff :
The runoff in inches from a rain of specified duration that causes a small stream to slightly exceed bankfull. When available, flood stage is used instead of slightly over bankfull.

Tipping-Bucket Rain Gage :
A precipitation gage where collected water is funneled into a two compartment bucket; 0.01, 0.1 mm, or some other designed quantity of rain will fill one compartment and overbalance the bucket so that it tips, emptying into a reservoir and moving the second compartment into place beneath the funnel. Tipping buckets provide a measurement of both intensity and amount of precipitation.

Toe of Dam (Upstream and Downstream) :
The junction of the face of a dam with the ground surface.

Toe Drain (or Outfall) :
A drain which carries seepage away from the dam and can allow seepage quantities to be measured.

Total Gross Reservoir Capacity :
The total amount of storage capacity available in a reservoir for all purposes from the streambed to the normal water or normal water or normal pool surface level. It does not include surcharge, but does include dead storage.

Trace :
A hydrograph or similar plot for an extended-range time horizon showing one of many scenarios generated through an ensemble forecast process.

Trace (of Precipitation) :
A rainfall amount less than 0.01 of an inch.

Transpiration :
Water discharged into the atmosphere from plant surfaces.

Trash Rack :
A screen located at an intake to prevent debris from entering.

Travel Time :
The time required for a flood wave to travel from one location to a subsequent location downstream.

Turbidity :
The thickness or opaqueness of water caused by the suspension of matter. The turbidity of rivers and lakes increases after a rainfall.

Turning Point :
A temporary point whose elevation is determined by additions and subtractions of backsights and foresights respectively.

Undercurrent :
A current below the upper currents or surface of a fluid body.

Underflow :
The lateral motion of water through the upper layers until it enters a stream channel. This usually takes longer to reach stream channels than runoff. This also called subsurface storm flow.

Unit Hydrograph (or Unitgraph) :
The discharge hydrograph from one inch of surface runoff distributed uniformly over the entire basin for a given time period.

Unit Hydrograph Duration :
The time over which one inch of surface runoff is distributed for unit hydrograph theory.

Unit Hydrograph Theory :
Unit Hydrograph Theory states that surface runoff hydrographs for storm events of the same duration will have the same shape, and the ordinates of the hydrograph will be proportional to the ordinates of the unit hydrograph. For example, the hydrograph for ½" of storm runoff will be half that of that from the unit hydrograph.

Universal Type Weighting and Recording Gage :
A gage which collects precipitation and then converts the weight onto an inked pen movement which traces on graph paper fixed to a clock driven drum.

Upstream Slope :
The part of the dam which is in contact with the reservoir water. On earthen dams, this slope must be protected from the erosive action of waves by rock riprap or concrete.

Urban Flash Flood Guidance :
A specific type of flash flood guidance which estimates the average amount of rain needed over an urban area during a specified period of time to initiate flooding on small, ungaged streams in the urban area.

Urban Flooding :
Flooding of streets, underpasses, low lying areas, or storm drains. This type of flooding is mainly an inconvenience and is generally not life threatening.

U.S. Army Corps of Engineers (USACE) :
As part of the Department of the Army, the Corps has responsibilities in civil and military areas. In civil works, the USACE has authority for approval of dredge and fill permits in navigable waters and tributaries thereof; the USACE enforces wetlands regulations, and constructs and operates a variety of water resources projects, mostly notably levee, dams and locks.

U.S. Bureau of Reclamation (USBR) :
The Federal agency whose mandate was to reclaim the arid west of the United States. Operating in 17 western states, this agency builds, operates and maintains a variety of irrigation, power, and flood control projects.

USFS :
The U.S. Forest Service.

U.S. Geological Survey (USGS) :
The Federal Agency chartered in 1879 by congress to classify public lands, and to examine the geologic structure, mineral resources, and products of the national domain. As part of its mission, the USGS provides information and data on the Nation's rivers and streams that are useful for mitigation of hazards associated with floods and droughts.

Vadose Zone :

The locus of points just above the water table where soil pores may either contain air or water. This is also called the zone of aeration.

Valve :

A device fitted to a pipeline or orifice in which the closure member is either rotated or moved in some way as to control or stop flow.

Velocity Zones :

Areas within the floodplain subject to potential high damage from waves. These sometimes appear on flood insurance rate maps.

Watercourse :

Any surface flow such as a river, stream, or tributary.

Watershed :

Land area from which water drains toward a common watercourse in a natural basin.

Water Equivalent :

The amount of water, in inches, obtained by melting a snow sample.

Water Pollution :

The alteration of the constituents of a body of water by man to such a degree that the water loses its value as a natural resource.

Water Supply Outlook :

A seasonal volume forecast, generally for a period centered around the time of spring snowmelt (e.g., April-July). The outlooks are in units of acre-feet and represent the expected volume of water to pass by a given point during a snowmelt season. The outlook categories include Most Probable, Reasonable Maximum, and Reasonable Minimum.

Water Supply Outlook (ESS) Product :

A public product issued by a Forecast Office which contains narrative and numeric information on current and extended water supply conditions.

Water Table :

The level below the earth's surface at which the ground becomes saturated with water. The water table is set where hydrostatic pressure equals atmospheric pressure.

Water Year :

The time period form October 1 through September 30.

Weighing-type Precipitation Gage :

A rain gage that weighs the rain or snow which falls into a bucket set on a platform of a spring or lever balance. The increasing weight of its contents plus the bucket are recorded on a chart. The record thus shows the accumulation of precipitation.

Weir :

(a) A low dam built across a stream to raise the upstream water level (fixed-crest weir when uncontrolled); (b) A structure built across a stream or channel for the purpose of measuring flow (measuring or gaging weir); (c) A structure built into a levee or river bank that allows water to flow from the main river channel into a bypass channel during time of high flows.

Wet Floodproofing :

An approach to floodproofing which usually is a last resort. Flood waters are intentionally allowed into the building to minimize water pressure on the structure. Wet floodproofing can include moving a few valuable items to a higher place or completely rebuilding the floodable area. Wet floodproofing has an advantage over other

approaches: no matter how little is done, flood damage will be reduced. Thousands of dollars in damage can be avoided just by moving furniture and appliances out of the flood-prone area.

Wetland :
An area that is regularly wet or flooded and has a water table that stands at or above the land surface for at least part of the year.

WFO :
A National Weather Service Weather Forecast Office.

Wire Weight Gage :
A river gage comprised of a weight which is lowered to the water level. The weight is attached to a cable; and as the weight is lowered, a counter indicates the length of cable released. The stage is determined from the length of cable required to reach the water level.

Z/R Relationship :
The empirical conversion relationship between radar reflectivity and precipitation rate.

Zero Datum :
A reference "zero" elevation for a stream or river gage. This "zero" can be referenced (usually within ten feet of the bottom of the channel) to mean sea level, or to any other recognized datum.

Zoned Embankment Dam :
An embankment dam which is comprised of zones of selected materials having different degrees of porosity, permeability and density.

Zone of Aeration :
The locus of points just above the water table where soil pores may either contain air or water. This is also called the vadose zone.

Zone of Saturation :
The locus of points below the water table where soil pores are filled with water. This is also called the phreatic zone.